

The Neogene includes the Aquitanian, which is often regarded as the Upper Oligocene, and ranges upward to include the Astian.

The strongest argument in support of Prof. Haug's dismemberment and abandonment of the Oligocene is derived from the importance of the Aquitanian transgression, whereby the marine rocks of that epoch advanced upon the land in many parts of Europe as well as in the Indian and Pacific Oceans. The transgression was, however, as the author admits, incomplete in the typical Aquitanian area, and the Burdigalian transgression was also of such great importance that there is much to be said for making it the separation between the Upper and Lower Kainozoic.

The post-Neogene deposits Prof. Haug groups together as the Quaternary, the name proposed by Desnoyers in 1829. He rejects Lyell's term Pleistocene on the ground that it is not euphonious, and "tout à fait" incorrect. But is Quaternary any better in these respects? Quaternarius means "consisting of four" or "containing four," as it is defined, for example, in Lewis and Short's "Latin Dictionary." The term is correctly employed in quaternion and in quaternary compounds, but not for the name of a fourth division of geological time. Should it not be Quartary? The term Pleistocene would certainly not be suitable for Prof. Haug's Quaternary group, which includes the Sicilian or Upper Pliocene of Calabria and Sicily, and also the Norwich Crag. The absorption of the Upper Pliocene in the Quaternary throws doubt on the advisability of separating that group from the Tertiary, and both may be conveniently combined as the Kainozoic.

The account of the Quaternary is mainly devoted to the Glacial period. Prof. Haug accepts a frequent repetition of interglacial periods, but makes no reference to Lamplugh's arguments against them. As in the earlier volumes the references to British authorities are scanty; thus in the accounts of the British Eocene deposits but few authorities are referred to, and the latest is a paper of 1891. The cause of the great glacial development is considered in a very interesting discussion. The author is obviously attracted by the possibility of explaining the glaciation of north-western Europe and eastern America by changes in the distribution of land and water, and by the refrigeration of the coasts of Europe when the North Atlantic continent had been sufficiently broken up to admit the Arctic waters. Prof. Haug has done good service to geology by his very suggestive and original treatise.

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#### ANALYTICAL CHEMISTRY.

- (1) *An Introduction to Quantitative Analysis*. By Dr. S. J. M. Auld. Pp. x+215. (London: Methuen and Co., Ltd., 1912.) Price 5s. (Text-books of Science.)
- (2) *Volumetric Analysis for Students of Pharmaceutical and general Chemistry*. By Charles H. Hampshire. Pp. vii+104. (London: J. and A. Churchill, 1912.) Price 3s. 6d. net.
- (3) *Water Analysis for Sanitary and Technical Purposes*. By Herbert B. Stocks. Pp. viii+136. (London: Charles Griffin and Co., Ltd., 1912.) Price 4s. 6d. net. (Griffin's Technological Handbooks.)
- (4) *Qualitative Organic Analysis*. By F. B. Thole. With an introduction by Dr. A. E. Dunstan. Pp. x+68. (London: Methuen and Co., Ltd., 1912.) Price 1s. 6d. (Text-books of Science.)
- (5) *Methods of Air Analysis*. By Dr. J. S. Haldane, F.R.S. Pp. x+130. (London: Charles Griffin and Co., Ltd., 1912.) Price 5s. net. (Griffin's Scientific Text-books.)

TEXT-BOOKS of analytical chemistry may be divided into two classes, that is, those that treat more or less completely of the subject with which they deal, and those that aim at making a judicious selection of work that will serve to ground the student in the principles of the subject, and give him such practical experience as circumstances will allow. (1), (2), and (4) of the above volumes belong to the second section. The number of elementary text-books already provided for the student of chemistry is so great that one is quite justified in asking why they should be added to. Among the reasons given, most of which are unworthy, there is one that deserves more attention than it receives. Some authors seem to think that each new edition of their book must be larger than the preceding, and so the volume gradually grows until it is much too large for the purpose for which it was intended—too bulky, too expensive, and too inclusive.

This, perhaps, is justification for the publication of Dr. Auld's book (1). We think that even he inclines to cover too wide a ground in his two hundred pages, because it is better for a student to learn a little well than to concern himself in a perfunctory manner with a great deal. When such a space as this includes introductory matter, volumetric analysis, gas analysis, gravimetric analysis, separations, the analysis of sundry minerals, water analysis, and the estimation of equivalent weights and vapour densities, many operations must be merely indicated, with the result that the student has not a description of what he wants in his own book for study. The international atomic weights are

given, but the "approximate values generally used" need revision (or deletion) when they range up to a discrepancy, in the case of zinc, of more than a half per cent. The author uses a nomenclature that we consider objectionable, though of course it is not original, as in the case of the analysis of barium chloride. Here we have "estimation of barium" and "estimation of chloride." The word "chloride" is used to indicate the combined chlorine, and as this word has for some generations indicated the whole salt, a new and additional meaning is given to an old word, and this leads to confusion. Moreover, this method is not consistent because, while it tries to distinguish between free and combined chlorine, there is no attempt made to distinguish between free and combined barium.

Mr. Hampshire (2) gives the usual selection of volumetric work that is prescribed for elementary students, but his book has a special value in including, after each section, short instructions for the examination of those pharmaceutical preparations that are appropriately analysed by the method described. Mr. Thole's "Qualitative Organic Analysis" (4) contains a considerable amount of information in a convenient form. It is gratifying to see that the author aims at treating the subject "on simple and logical lines." But there are other logical methods of work, and, at the same time, simpler systems from a practical point of view, besides the one that begins with six tests for elements, and follows these with more than a dozen "additional preliminary tests," with six more to be added "if the substance is carbocyclic," before going to the "distinguishing and confirmatory tests." It ought not to be a question of the choice between this tedious method and the random guessing referred to in the introduction, and which admittedly is far too general. These three volumes have been carefully prepared and will take their places as useful laboratory text-books.

The other two volumes are not beginners' books. Mr. Herbert B. Stocks, in his "Water Analysis" (3), solves the old controversy as to the respective merits of getting at the organic matter by Wanklyn's distillation with alkaline permanganate and Frankland's combustion for carbon and nitrogen, by giving both. Similarly he gives both Clark's soap method and Hahnemann's titration method for hardness. A great deal of the book is very familiar reading. The author rightly says that the biological examination requires separate treatment. When he says that the microscopical examination is included, we turned with interest to this heading and were disappointed to find that only a page is devoted to it.

Dr. Haldane's "Methods of Air Analysis" (5) is

a volume of an essentially different character from any of the preceding. It contains a description of methods of air and gas analysis that the author has found useful in connection with experimental work in physiology, chemistry, and hygiene. The practical details of the methods are many of them original, and the description of them gives exactly what the worker in this branch of analysis would wish to know. The larger apparatus for air analysis has a gas-measuring vessel that holds 21 c.c. and gives readings to 0.001 c.c. Absorptions are done in attached pipettes, and a control tube does away with the need for barometer and thermometer. A smaller portable apparatus allows of an error limit of 0.1 per cent. Other portable apparatus for special purposes are described, such as for small percentages of carbon dioxide, and the examination of the air in mines. The recognition and estimation of small proportions of carbonic oxide in air by means of the blood test are fully dealt with. Flame methods of estimating oxygen and methane are given, and the detection of various poisonous gases and the estimation of dust are shortly described. It is a thoroughly practical book, and deals with this important subject concisely and yet fully.

#### OUR BOOKSHELF.

*Views and Reviews.* From the Outlook of an Anthropologist. By Sir Harry Johnston, G.C.M.G., K.C.B. Pp. v + 314. (London: Williams and Norgate, 1912.) Price 3s. 6d. net.

IN his most recent book Sir Harry Johnston has re-written several articles that have appeared in various journals and included some lectures on colonial subjects. Despite the diversity of subjects here treated there runs through all the broad views of a man who has seen much and travelled far, and an attempt to give an anthropological explanation to the matters dealt with. The foreign relations and colonial aspirations of Germany, however, do not concern us here. The opening chapter consists of an earnest appeal for the recognition of anthropology by the Government, and we hope that some of our legislators will take it to heart. The Royal Anthropological Institute has only one underpaid official, not "two paid officials" (p. 5), and the total membership is but 508; it will be a happy day when it "scarcely reaches to two thousand" (p. 8). The chapters on Ireland are of considerable interest, and contain some first-hand observations, but we doubt if portions of them will be acceptable to the Irish. Sir Harry, despite the almost universal opinion of British archaeologists to the contrary, accepts the occurrence of Palæolithic man in Scotland and Ireland (p. 63), but in the following passage picturesqueness predominates over sober narration of ascertained facts:—"The westernmost Aryans, armed with iron weapons, first conquered, then intermarried